NAVSEA
STANDARD ITEM

FY-05

ITEM NO: 009-71
DATE: 29 AUG 2003
CATEGORY: II

1. SCOPE:

1.1 Title: Testing Requirements for Piping Systems; accomplish

2. REFERENCES:

2.1 S9086-RK-STM-010/CH-505, Piping Systems

2.2 S9074-AR-GIB-010/278, Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels

2.3 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

2.4 MIL-STD-2035, Nondestructive Testing Acceptance Criteria

3. REQUIREMENTS:

3.1 Accomplish testing of new and disturbed piping systems in accordance with 2.1.

3.1.1 Master and backup test gage shall conform to gage range and graduation shown on Table One.

(I) "LIQUID PENETRANT INSPECTION" or "MAGNETIC PARTICLE INSPECTION"

3.1.2 Accomplish liquid penetrant or magnetic particle test on root layer of all ***P-1 and/or P-LT*** weld***ed*** joints in accordance with Paragraph 505-11.1.2.6.a(1) of 2.1, ***and the requirements of*** 2.2 and 2.3. The accept or reject criteria shall be in accordance with Class One of 2.4.

(I) "LIQUID PENETRANT INSPECTION"

3.1.3 Accomplish liquid penetrant tests on final layer of all ***P-1 and/or P-LT*** weld***ed*** joints in accordance with Paragraph 505-11.1.2.6.a(***1***) of 2.1, ***and P-2 welded joints in accordance with Paragraph 505-11.1.2.6.a(2) of 2.1 for operating conditions greater than 200 degrees Fahrenheit or 200 PSIG, and the requirements of*** 2.2 and 2.3. The accept or reject criteria shall be in accordance with Class One of 2.4 ***for P-1 and/or P-LT, and Class 2 of 2.4 for P-2.***

(V)(G) or (I)(G) "VISUAL INSPECTION - SHOP TEST" (See 4.2 ***for criteria***)

3.1.4 Visually inspect each pressurized components for evidence of external leakage and deformation. Allowable external leakage: None.

(V)(G) or (I)(G) "VISUAL INSPECTION - HYDROSTATIC OR OPERATING PRESSURE TEST" (See 4.2 ***for criteria***)

3.1.5 Visually inspect the pressurized system for evidence of external leakage and deformation. Allowable external leakage: None.

3.1.5.1 Joints requiring inspection shall remain uninsulated and unpainted until completion of successful inspection.

(V)(G) "STATIC TEST"

3.2 Accomplish a Static Head Pressure Test of new and disturbed gravity drain piping (unpressurized piping), using clean, fresh water for a minimum of 30 minutes. Allowable leakage: None.

(V)(G) "OPERATIONAL TEST"

3.2.1 Accomplish an Operational Test of new and disturbed gravity drain piping for proper operation and unobstructed flow.

(V)(G) "OPERATIONAL TEST"

3.2.2 Accomplish an Operational Test of new and disturbed sounding tube piping by inserting a 16-inch theft sampler into sounding tube until it bottoms. Accomplish the test a minimum of four times for each sounding tube. There shall be no binding or sticking of sampler during this test.

4. NOTES:

4.1 Boiler pressure vessel piping is defined as, "The piping from the pressure vessel drum or header up to the first valve off the pressure vessel drum or header."

4.2 The paragraph referencing this note is considered an (I)(G) if the system is P-1, P-LT, or P-3A. If the system is P-2 or P-3B, then the paragraph is considered (V)(G).

4.3 Test pressure and test medium will be specified in invoking Work Item.

TABLE ONE - MASTER GAGE SELECTION FOR HYDROSTATIC TESTS

Maximum Test Pressure (lb/in^2g)		Master Gage Range (lb/in^2g)***		Master Gage Maximum Graduation Size (lb/in^2g)
From*	To**	From	To	
5000	9500	0	10000	100
3000	5800	0	6000	30
2500	4800	0	5000	30
1500	2800	0	3000	20
1000	1800	0	2000	15
750	1300	0	1500	10
500	800	0	1000	10
250	500	0	600	5
150	250	0	300	2
100	175	0	200	2
75	125	0	160	1
50	80	0	100	1
20	50	0	60	0.5
10	25	0	30	0.2
7	10	0	15	0.1
5	7	0	10	0.1

NOTES:

1. Master gage and back-up gages shall track within two percent of each other.

2. System maximum test pressures shall be determined by applicable overhaul specification, building specification, or other governing documents.

* Values agree with the requirement that gage range shall not exceed 200 percent of maximum test pressure except for gage ranges 0 to 60 and below.

** Values allow for reading pressures up to relief valve setting.

*** Exceptions to the values given in this table may be approved locally by Design, based on an evaluation of test pressure, gage range, and specific application.